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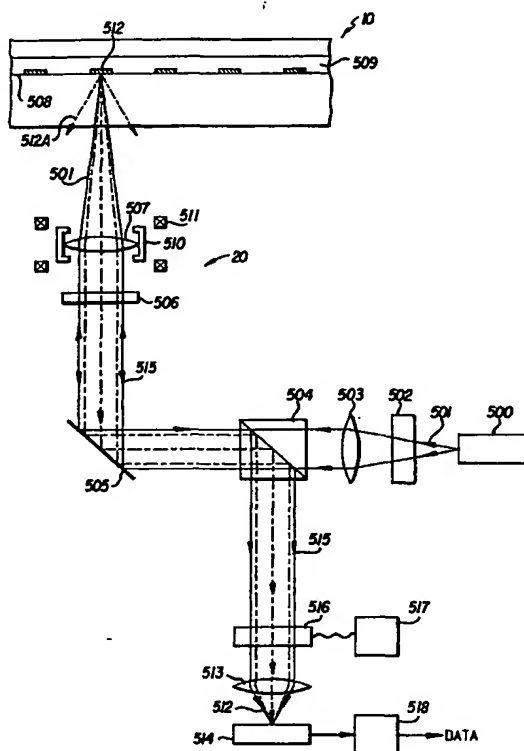
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[Continued on next page]

(54) Title: OPTICAL DATA STORAGE SYSTEM HAVING COMBINED FLUORESCENT THREE-DIMENSIONAL INFORMATION CARRIER



(57) Abstract: A general optical storage system (OSS) contains an optical drive and a fluorescent multilayer disc (FMLD) (10), which can be realized as a multilayer structure with data storage in fluorescent spots like pits or spiral grooves, divided by layers, transparent to reading and fluorescent radiation. The OSS includes a spectrum filter (516) and fluorescent signal reception device (514), capable of reading FMLD, as well as reflective CD and DVD discs (including CD-R, CD-RW, DVD-R, etc.). Increase of pit width in FMLD and use of microangle mirrors allow increasing information signal. Elimination of FMLD fluorescence lifetime influence on data pulses duration allows increasing data reading rate. The absorption indices of different layers of FMLD were optimized.

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- With international search report.
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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 00/19422

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G11B7/005 G11B7/24 G11B7/135 C09K11/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G11B C09K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 25262 A (GLUSHKO BORIS ALEXY ; OMD OPTICAL MEMORY DEVICES LTD (IL); LEVICH E) 11 June 1998 (1998-06-11) abstract claims 1,13,18; figure 1	1-3,22
Y A		10,11 4-9, 23-26
X	WO 99 23647 A (GLUSHKO BORIS ; ORBACH ZEEV (IL); OMD DEVICES L L C (US)) 14 May 1999 (1999-05-14) page 9, line 4 - line 18 page 17, line 14 - page 18, line 6; figure 9	1,2, 22-25
A		3-9,26
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*S\* document member of the same patent family

Date of the actual completion of the international search

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13. 03. 2001

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

Int. l. Application No  
PCT/US 00/19422

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 09550 A (GLUSHKO BORIS ;KRUPKIN VLADIMIR (IL); OMD DEVICES L L C (US)) 25 February 1999 (1999-02-25) abstract column 8, line 8 -column 9, line 19; figure 1 ---	1,2,22
X	WO 99 23649 A (GLUSHKO BORIS ;OMD DEVICES L L C (US); LEVICH EUGENE B (US)) 14 May 1999 (1999-05-14) the whole document ---	10,11, 27-31, 35-38,44
Y	---	10,11, 43, 45-47,50
A	---	12,16-18
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X	DE 44 44 988 A (WENDT ULRICH DR RER NAT HABIL) 20 June 1996 (1996-06-20) the whole document ---	1,23,24
Y	---	43
A	EP 0 354 601 A (PIONEER ELECTRONIC CORP) 14 February 1990 (1990-02-14) the whole document ---	1-3, 10-12, 17,22-25
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A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 11, 30 September 1999 (1999-09-30) & JP 11 149663 A (TOSHIBA CORP), 2 June 1999 (1999-06-02) abstract ---	20
Y	WO 98 33864 A (CIBA GEIGY AG) 6 August 1998 (1998-08-06) abstract page 2, paragraph 5 -page 6, paragraph 3 page 30, paragraph 1 -page 31, paragraph 1 page 78, paragraph 6 -page 80, paragraph 1 -----	45-47,50
A	-----	48

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 00/19422

### Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-9 22-26

Optical data storage and reading device comprising a multilayer fluorescent information-carrying optical disc, characterised by the type of filter used to spatially separate the reading radiation from the information-carrying radiation.

2. Claims: 10-19

Optical data storage and reading device comprising a multilayer fluorescent information-carrying optical disc, characterised in having a light controlling element for increasing an amount of the information-carrying radiation which reaches the detector.

3. Claims: 20-21

Optical data storage and reading device comprising a multilayer fluorescent information-carrying optical disc, characterised in having a compensating electronic device for compensating for an influence of dye fluorescence lifetime.

4. Claims: 27-44 51

A multilayer hybrid fluorescent optical disc characterised by its structure.

5. Claims: 45-50

Fluorescent composition for a hybrid fluorescent optical disc.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. Application No

PCT/US 00/19422

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